

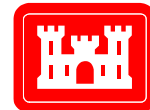
Project Management Plan

Feasibility Phase

Dare County Beaches
(Hatteras and Ocracoke Islands)
Shore Protection

PWI 012835

October 2003



**US Army Corps
of Engineers®**
Wilmington District

**PROJECT MANAGEMENT PLAN
DARE COUNTY BEACHES
(HATTERAS AND OCRACOCK ISLANDS)
SHORE PROTECTION
FEASIBILITY STUDY
NORTH CAROLINA**

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PROJECT MANAGEMENT PLAN

DARE COUNTY BEACHES (HATTERAS AND OCRACOCK ISLANDS) SHORE PROTECTION PROJECT DARE COUNTY, NORTH CAROLINA

Overview and Introduction: This Project Management Plan (PMP) for Dare County Beaches (Hatteras and Ocracoke Island Portion) was prepared in accordance with Engineer Regulation (ER) 5-1-11, *U.S. Army Corps of Engineers Business Process*, dated 17 August 2001, and ER 1105-2-100, *U.S. Army Corps of Engineers, Planning Guidance Notebook*, dated 22 April 2000. This PMP will be used to define and manage the development and conduct of a feasibility study to develop and evaluate alternatives for implementing solutions for shoreline protection and related problems associated with the Dare County Beaches (Hatteras and Ocracoke Islands). This PMP has been developed as a cooperative effort by the U.S. Army Corps of Engineers, Wilmington District (Corps) and the project's non-federal cost sharing sponsor, the North Carolina Department of Transportation (NCDOT).

PMP Responsibilities: This PMP is not intended to be all-inclusive, nor is it intended to anticipate all of the possible changes that can happen to a project during its execution. This is a dynamic document listing responsibilities and requirements of the parties involved in the execution of this project. This PMP will be updated by the Corps' Project Manager (PM) and sent to the Project Delivery Team (PDT) to reflect changing requirements and conditions.

Study Authority: This study will be conducted pursuant to two congressional resolutions pertaining to Dare County and Hyde County. The primary study emphasis will be directed toward shore protection measures at Pea Island, Hatteras Island and Ocracoke Island. The text of the authorizing resolutions is as follows:

Resolution Adopted 1 August 1990, by The United States House Of Representatives:

"Resolved by the Committee on Public Works and Transportation of the United States House of Representatives, That the Secretary of the Army, in accordance with section 110 of the River and Harbor Act of 1962, is requested to make, under the direction of the Chief of Engineers, studies of the Dare County beaches, Dare County, North Carolina, in the interest of beach erosion control, hurricane protection, storm damage reduction needs, and related purposes."

Resolution Adopted 16 February 2000, by The United States House of Representatives:

"Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That the Secretary of the Army is requested to review the report of the Chief of Engineers on Ocracoke Island, North Carolina, published as House Document Number 109, 89th Congress, 1st Session, dated March 10, 1965, and other pertinent reports, to determine whether any modifications of the recommendations contained therein are advisable at the present time in the interest of shore protection and related purposes for Ocracoke Island, North Carolina.."

Study Area Description: Dare County and Hyde County Beaches are located on the northeastern North Carolina coast. The primary geographical area for this report includes Pea Island, Hatteras Island, and Ocracoke Island. The purpose of this feasibility study is to investigate shore protection needs for Pea Island, Hatteras Island, and Ocracoke Island and to investigate various alternatives that will provide protection for North Carolina Highway 12 (NC Hwy 12), as requested by the NCDOT. The study of the communities of Nags Head, Kill Devil Hills, and Kitty Hawk was documented in a separate interim report entitled: *Final Feasibility Report and Environmental Impact Statement On Hurricane Protection and Beach Erosion Control, Dare County Beaches (Bodie Island Portion), Dare County, North Carolina*.

Scope of the Feasibility Study: Based on the authority contained in the above congressional resolutions, the scope of this study is limited to developing solutions to problems associated with ocean shoreline erosion and damage caused by ocean storms and their related impacts.

Previous Corps of Engineers Studies: The Corps has undertaken the following studies in Dare and Hyde Counties:

House Document No. 763, "North Carolina Shoreline, Beach Erosion Study." This report, approved by Congress in 1948, presents the results of an investigation of beach erosion along the North Carolina shoreline conducted as part of a comprehensive study of shore protection needs for the North Carolina shoreline.

House Document No. 476, "Outer Banks Between Virginia State Line and Hatteras Inlet, North, Carolina." This report, approved by Congress in 1966, presents the results of an investigation of beach erosion as part of a comprehensive study of shore protection needs for the North Carolina shoreline between Virginia and Hatteras Inlet.

House Document No. 93-121, "National Shoreline Study." This report, approved by Congress in 1970, presents the results of an investigation of the nations' shorelines as part of a comprehensive study to address shoreline conditions including shoreline ownership, property values, and shoreline changes (eroding, stable, or accreting).

Flood Insurance Studies for Nags Head, Kill Devil Hills, Kitty Hawk, Southern Shores, and Unincorporated Areas of Dare County. These reports dated 1986 for Nags Head, 1986 for Kill Devil Hills, 1986 for Kitty Hawk, 1987 for Southern Shores, and 1986 for unincorporated areas of Dare County, were prepared for flood insurance purposes.

Reconnaissance Report on Hurricane Protection and Beach Erosion Control, Dare County Beaches, North Carolina. In 1993 the Corps prepared a report entitled: *Reconnaissance Report on Hurricane Protection and Beach Erosion Control, Dare County Beaches, North Carolina*. The purpose of this reconnaissance study was to determine if an economically feasible plan of protection could be identified to reduce hurricane and storm damages and prevent beach erosion along the shoreline of Dare County. The study sponsor was Dare County. The areas evaluated during the study were limited to areas in which the sponsor expressed interest.

The following plan was developed for the shoreline north of Oregon Inlet, which was of concern to Dare County. The recommended plan of improvement consists of a 50 ft wide beach berm at 7.0 ft. NGVD. Three separate areas will be covered. Each area includes a 3000-ft long transition zone at each end to tie the berm in with the existing beach. The fill material is to be obtained from offshore sources. Periodic nourishment is expected to be required at 3-year intervals.

On Pea Island and Hatteras Island (Pea Island and Hatteras Island were formerly two islands separated by New Inlet, which closed naturally in 1947. The island is now known as Hatteras Island.), The NCDOT has identified five problem areas. Corrective measures need to be instituted at each location to prevent the island from becoming fragmented. There would be no point in taking care of one of the areas without making plans to perform corrective action at the other four. The areas vary in severity; in the South Pea Island area, NCDOT has constructed a sandbag revetment as a temporary measure to allow the road to remain in place. The NCDOT has identified problems at the following locations: North Pea Island, South Pea Island, Rodanthe, Buxton, and Hatteras. In the absence of action, Hatteras Island would become inaccessible by car from the north, and eventually most of the island would be cut off from the south; only Hatteras could be reached by ferry from Ocracoke Island. More temporary measures to stabilize this area will almost certainly be required before a long-term solution could be implemented.

Manteo (Shallowbag) Bay, North Carolina, Supplement No. 2, General Design Memorandum - The General Design Memorandum, dated January 1999, has been devoted to navigation improvements (jetties at Oregon Inlet), which is located in Dare County. The President's Council on Environmental Quality issued a decision in 2003 effectively stopping all work on this project.

Previous Studies by Others: The Outer Banks Task Force (OBTF) is a group of nine state and federal agencies dedicated to the development of a long-range plan to protect the road system on the Outer Banks of North Carolina. This group was formed in cooperation with NCDOT, the non-federal sponsor of this study. The agencies involved in the task force include: (1) North Carolina Department of Transportation; (2) National Park Service, Cape Hatteras National Seashore; (3) U.S. Army, Corps of Engineers, Wilmington District; (4) U.S. Fish and Wildlife Service; (5) National Marine Fisheries Service; (6) Federal Highway Administration; (7) Dare County, (8) Hyde County, and (9) North Carolina Department of Environment and Natural Resources. The task force is dedicated to maintaining access to the Outer Banks and providing safe transportation, while minimizing impacts to Hatteras Island and Ocracoke Island, causing minimal environmental impacts.

Outer Banks Task Force OBTF Hot Spots: The OBTF has identified six "hot spots" along NC Hwy 12 that are being impacted by dune erosion which allows water and sand to collect on NC Hwy 12 during storms. Wind also blows sand onto the roadway creating maintenance problems. The hot spot areas have the highest occurrence of these problems. The dune erosion rate varies at each site but is estimated between 8 to 14 feet per year. The NCDOT is providing short-term protection to these areas to maintain the integrity of NC Hwy 12. Long-term solutions for providing protection to these hot spots will be investigated during this feasibility study. However, the feasibility study will also investigate other areas, as appropriate. The following "hot spots" identified by OBTF will be investigated:

- **The Hatteras Village hot spot** (TIP No. R-3116 B) begins near SR 1272 in Hatteras Village and extends north 1.7 miles.
- **The Ocracoke Island hot spot** (TIP No. R-3116 A) begins just south of the Hatteras ferry terminal continuing 4 miles southward on Ocracoke Island.

Existing Conditions: The portion of NC Hwy 12 located in the study is vulnerable due to frequent overwash and flooding from the Atlantic Ocean. At such times, NC Hwy 12 is impassable, leaving several communities to the south without highway access to the mainland. The frequent overwash has required continual maintenance of the roadway and threatens the viability of the highway; the only link from the southern parts of Hatteras Island to the Dare County mainland.

Future Without Project Conditions: Unless the above trends are reversed or at least stabilized, there is a danger that NC Hwy 12 will be severely damaged and use of the highway as a transportation corridor will no longer be viable. Ongoing NCDOT studies for the replacement of the Bonner Bridge may create a long-term solution for the northerly three hotspots. The Dare County Beaches (Hatteras and Ocracoke) feasibility study will develop a long-term solution for any sections of NC Hwy 12 between Whalebone Junction and Ocracoke Inlet not addressed by other NCDOT long-term projects.

Alternatives to be Considered During the Feasibility Study: The following erosion "hot spots" will be addressed in this feasibility study. If current NCDOT studies develop long-term solutions for these hot spots, the scope of this feasibility study will be adjusted accordingly. In addition, other erosion problems identified by this feasibility study will be addressed.

- **The Hatteras Village hot spot** (TIP No. R-3116 B) begins near SR 1272 in Hatteras Village and extends north 1.7 miles.
- **The Ocracoke Island hot spot** (TIP No. R-3116 A) begins just south of the Hatteras ferry terminal continuing 4 miles southward on Ocracoke Island.

The OBTF "hot spots" are areas where there is an immediate concern that NC Hwy 12 will be compromised. In addition to addressing these areas, this feasibility study will address other long-term shoreline erosion problems on Hatteras and Ocracoke Islands that may be identified during conduct of this study.

Coastal Barrier Resources Act Considerations: The NCDOT, "Outer Banks Hot Spots" locations are shown on the Dare County, North Carolina Coastal Barrier Resources System (CBRS), Cape Hatteras Unit 03P and Dare County, North Carolina, CBRS, Cape Hatteras Unit NC-03P, Hatteras Island Unit L03, dated 18 October 1999. All of the "Hot Spot" study areas fall within NC-03P, which is defined on the CBRS maps as "otherwise protected areas" not within the CBRS. None of the study areas fall within Unit L03, which is described on the map as being "units in the CBRS. No investigations of long-term shoreline erosion problems will be undertaken in the designated CBRS.

Monitoring Effectiveness of Solutions: All alternatives selected will require a plan to be developed and implemented that will monitor the effectiveness of the completed project over a

period of several years. This data will assist the Corps and the non-federal sponsor in determining the effectiveness of the project in performing its design functions.

Corps Planning Guidance: The reconnaissance report determined that there were sufficient indications that solutions to the study area's problems could be formulated that are cost-effective and would produce significant environmental benefits. However, detailed comparisons of alternative plans, design of project features, assessment of environmental benefits and impacts, calculation of economic benefits, quantification of environmental outputs, and preparation of plans and specifications, will be accomplished in project phases described in this PMP using applicable Corps planning policies and guidelines. The feasible solutions will be examined collectively to develop a multi-objective water resource plan that could alleviate the existing water resource problems and reduce the potential for further environmental degradation.

PROJECT TASKS AND DECISION POINTS

DARE COUNTY BEACHES OCRACOE AND HATTERAS

DATA NEEDS - Determine data needs, data gaps, identify studies to fill needed gaps, prepare detailed scopes of work to accomplish needed studies and surveys, identify costs of needed studies and surveys, and assign tasks to appropriate elements.

- Determine Data Available from Existing Sources
 - Erosion models, analysis
 - Erosion for 50 year project life
 - Beach Erosion Rates
 - Cross sections and sand samples
 - Geologic Framework
 - Sound-side and Island erosion and geology
 - Offshore Geology
 - Synthesis of erosion analysis and geologic framework
 - Social Setting
 - Describe Population Served
 - Number of Full year residents
 - Number of Seasonal residents
 - Number of Tourists
 - Economic Importance of Transportation Corridor
 - Tourist Impacts to economy
 - Commercial Fishing
 - Recreational Fishing
 - Manufacturing
 - Emergency Protection
 - Public Services, Facilities
 - Natural Systems
 - Cultural Resources
 - Hazardous Materials
 - Transportation Analysis
 - Section 4(f) Evaluation
 - Geographic Information System
 - Existing Coverages Available from State Data Sources
 - Geospatial Photogrammetry
 - Location and Surveys
 - Digital orthophotography coverage of study area
 - Control Panels
- Present the Project Management Plan to an Interagency Group
- Determine Data Gaps Which Exist In Data Available from Existing Sources
- Determine Additional Data Requirements
- Write Scopes of Work for Acquiring Additional Data

REQUIRED ANALYSIS: Perform needed studies, describe, in depth, problem, needs, and opportunities, establish specific goals and objectives for further study establish methodology and identify cost and responsibilities for implementation. Perform required analysis of erosion, underlying geology, economic conditions, social setting, and environmental issues.

- Approach to Decision Point 1 presented to interagency group
- Perform Recommended Data Acquisition Tasks (See DATA NEEDS)
- Problem Definition
 - Erosion models, analysis, and conclusions
 - Geologic Framework
 - Sound-side and Island erosion and geology
 - Offshore Geology
 - Synthesis of erosion analysis and geologic framework
- Establish and Describe Without Project Conditions
 - Determine Erosion for 50 year project life
 - Determine Beach Erosion Rates
 - Cross sections and sand samples
 - Perform Analysis of Social Setting (Affected Community)
 - Describe Population Served
 - Number of Full year residents
 - Number of Summer residents
 - Number of Tourists
 - Describe Economic Importance of Transportation Corridor
 - Describe the Tourist Impacts to economy
 - Describe Impacts on Commercial Fishing
 - Describe Impacts on Recreational Fishing
 - Describe Impacts Manufacturing
 - Describe Impacts on Emergency Protection
 - Describe Impacts on Public Services, Facilities
 - Concurrence Point 1 – Regulatory and Resource agency concurrence on Purpose and Need
- Perform Environmental Inventory (Describe the Affected Environment)
 - Perform Analysis of Natural Systems
 - Perform Cultural Resources inventory
 - Perform Hazardous Materials Evaluation
 - Perform Transportation Analysis
 - Perform Section 4(f) Evaluation
 - Photogrammetry Unit, Location and Surveys Unit work
 - Digital orthophotography coverage of study area
 - Map Locations of Submerged Aquatic Vegetation (SAV)
 - Control Panels
 - Photography and Photogrammetry mapping
- Analyze Data to determine Project Needs
- Define Project Objectives
- Establish Methodology to Accomplish Objectives
- Identify cost to Accomplish Objectives
- Define Responsibilities Required to Accomplish Concurrence Point 3

ANALYSIS OF ALTERNATIVES - Develop alternatives to meet objectives, determine outputs and impacts associated with each alternative, and perform trade off analysis.

Analysis of Alternatives

Decision Point 3 – Alternatives for Detailed Study

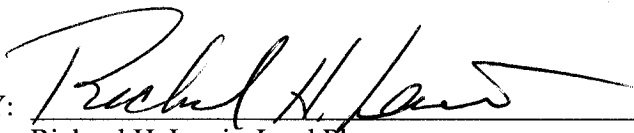
- Alternative 1 - Periodic Relocation of Road
 - Preliminary Design
 - Cost Estimate
 - Environmental Effects - Alt 1
 - Natural Systems Effects
 - Cultural Resources Effects
 - Social/Community Effects
- Alternative 2 - Build Bridges
 - Preliminary Design and Cost Estimate
 - Environmental Effects - Alternative 5
 - Natural Systems Effects
 - Cultural Resources Effects
 - Social/Community Effects
- Alternative 3 - Beach Nourishment
 - Borrow Source Identification
 - Design of Beach
 - Profile
 - Frequency of Nourishment
 - Cost Estimate
 - Natural Systems Effects
 - Cultural Resources Effects
 - Social Effects
- Alternative 4 - Beach Nourishment with Groin at Ocracoke
 - Design Groin at Ocracoke Ferry
 - Cost Estimates
 - Revision to Nourishment Design
 - Natural Systems Effects
 - Cultural Resources Effects
 - Social Effects
- Alternative 5 - Ferry Options
 - Location Evaluation
 - Design
 - Cost Estimates
 - Natural Systems Effects
 - Cultural Resources effects
 - Community Effects
- Alternative 6 - Community Buy-out and Relocation
 - Natural Systems Effects
 - Cultural Resources Effects
 - Social Effects

Cursory analysis of other alternative (not studied in detail)

ALTERNATIVE SELECTION

- Selection of recommended plan (Net Economic Development (NED) Plan and/or locally preferred plan). Produce Feasibility Report and draft Environmental Impact Statement
- Draft Feasibility Report/EIS and Public Hearing
 - Compilation/Writing/Review
 - Reproduction/Distribution
 - Feasibility Report/EIS Publication, Receive Public and Agency Written Comments
 - Public Involvement
 - Continuing Public Outreach
 - Public Review - Alternatives Selected for Detailed Study
 - Public Review - Analysis/Comparison of Alternatives
- * Concurrence Point 4 Selection of Locally Preferred Plan
- * Final EIS
- * Project Management (interim reports, scheduling, funds mgmt, coordination, progress reports)

PMP PREPARED BY:

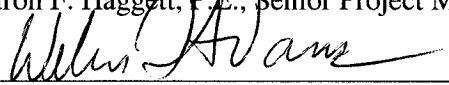

Richard H. Lewis, Lead Planner

REVIEWED:

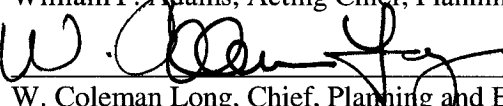
Project Manager:


Sharon F. Haggett, P.E., Senior Project Manager

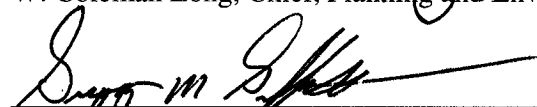
CESAW-TS-PS:


William F. Adams, Acting Chief, Planning Services Section

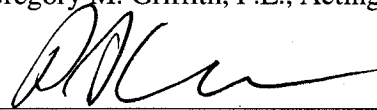
CESAW-TS-P:


W. Coleman Long, Chief, Planning and Environmental Branch

CESAW-TS-E:


Gregory M. Griffith, P.E., Acting Chief, Engineering Branch

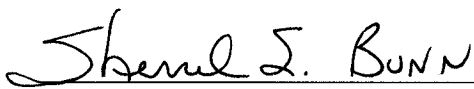
CESAW-TS-C:


Phil Kadala, Chief, Construction Branch

CESAW-TS:


Ben Wood, P.E., Chief, Technical Services Division

CESAW-CT:


Sherrel Bunn, Chief, Contracting Division

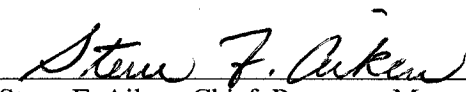
CESAS-RE:

Tommy R. Hill, Chief, Savannah District – Real Estate Division

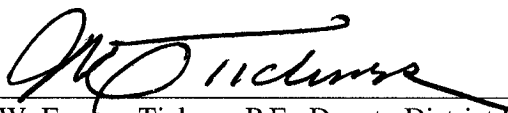
CESAW-PM-C:


Wayne Bissette, P.E., Chief, Project Management Branch

CESAW-PM-P:


Steve F. Aiken, Chief, Programs Management Branch

CESAW-DDPM:


W. Eugene Tickner, P.E., Deputy District Engineer
Programs & Project Management

References Cited

U.S. Army Corps of Engineers

2001 Engineer Regulation 5-1-11, *U.S. Army Corps of Engineers Business Process*, dated 17 August 2001, visited 11 December 2002, <http://www.hq.usace.army.mil/pmbp/er/draftER.html>

Engineer Regulation 1105-2-100, *U.S. Army Corps of Engineers, Planning Guidance Notebook*, dated 22 April 2000, visited 11 December 2002, <http://www.usace.army.mil/inet/functions/cw/cecwp/pgncover.htm>

U.S. Army Corps of Engineers, Wilmington District

1993 *Reconnaissance Report on Hurricane Protection and Beach Erosion Control, Dare County Beaches, North Carolina*, MS. on file, U.S. Army Corps of Engineers, Wilmington District.

2000 *Final Feasibility Report and Environmental Impact Statement On Hurricane Protection and Beach Erosion Control, Dare County Beaches (Bodie Island Portion) Dare County, North Carolina*, (Volumes 1 & 2), North Carolina, MS. on file, U.S. Army Corps of Engineers, Wilmington District.

Outer Banks Task Force

2002, Outer Banks Task Force Homepage, visited 11 December 2002, <http://www.obtf.org/>

United States House of Representatives

1990 Resolution Adopted 1 August 1990, by The United States House Of Representatives:

2000 Resolution Adopted 16 February 2000, by The United States House Of Representatives:

PROJECT MANAGEMENT PLAN
FEASIBILITY PHASE
DARE COUNTY BEACHES
(HATTERAS AND OCRACOE ISLANDS)
SHORE PROTECTION
APPENDICES

Appendix A
Detailed Scope of Work
U.S. Army Corps of Engineers
Savannah District
Real Estate Division

Appendix A

Detailed Scope of Work

U.S. Army Corps of Engineers, Savannah District, Real Estate Division (CESAS-RE)

Real Estate Supplement Appendix: The report includes an evaluation of the real estate requirements describing the proposed project currently under consideration in which a federal interest might exist. The real estate items of work to be included in this report will include descriptions of the minimum real estate requirements for the proposed project, estates to be acquired for the project, and land cost (lands, easements, rights-of-way and relocations and disposal/borrow areas (LERRD's)), with costs estimated using the MCASES computer system in the cost code accounts format, as well as the schedule for real estate activities. This research will be organized into a Real Estate Appendix for the feasibility report.

Search of Public Records: Real estate work items will require a search of the local public records, i.e. tax office and county clerk's office, to obtain ownership data including owners and types of residential, industrial, or commercial properties, the estimated acreage, potential Public Law 91-646 relocations, the estates to be acquired and any other real estate requirements appropriate for the project.

Assessment of Relocation Requirements: An assessment will be made of what facilities must be relocated, including roads, pipelines, utilities, and bridges, when applicable. The Real Estate Appendix will include a statement as to whether the Government, the sponsor, or the owners will be responsible for the relocation and acquisition of the required rights-of-way and for the costs of relocation and land to be acquired allocated to each entity. Other investigations of land for the borrow areas, pipelines routes, and staging areas will be conducted. The NCDOT's Right of Way, appraisal, and Relocation Assistance personnel may undertake portions of this work.

Gross Appraisal: A gross appraisal of the costs will be prepared. This work includes a discussion of the existing restrictions of the easements, a total estimated value for fee and easement estates, (including improvements, minerals, if any, severance damages, special features of the land, timber, minerals, water rights, existing encumbrances, the highest and best use involved), the verified market data utilized to support the valuation, a discussion of the relationships between the market (support and analysis) and the subject area, and appraiser qualifications. This document must be of sufficient detail to provide a cost estimate that will be sufficient for project authorization. This appraisal is expected to be in compliance with the Uniform Standards of Professional Appraisal Practice as promulgated by the Appraisal Standards Board of the Appraisal Foundation.

Data Needs Labor Cost For CESAS-RE	\$20,000
Required Analysis Labor Cost For CESAS-RE	\$20,000
Analysis Of Alternatives Labor Cost For CESAS-RE	\$20,000
Alternative Selection Labor Cost For CESAS-RE	\$20,000

TOTAL HIRED LABOR COST FOR CESAS-RE	\$80,000
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PROJECT MANAGEMENT PLAN
FEASIBILITY PHASE
DARE COUNTY BEACHES
(HATTERAS AND OCRACOE ISLANDS)
SHORE PROTECTION
APPENDICES

Appendix B
Detailed Scope of Work
U.S. Army Corps of Engineers
Wilmington District
Contracting Division

Appendix B

Detailed Scope of Work

U.S. Army Corps of Engineers, Wilmington District, Contracting Division (CESAW-CT)

Acquisition Responsibilities: The Contracting Division has overall responsibility for the acquisition responsibilities, to include providing input for acquisition strategy, acquisition reviews and contract execution, for the project. The following specific elements pertain to the scope and estimated labor cost of the feasibility phase.

Attendance at Meetings: As an acquisition Project Delivery Team member, attend meetings on matters of contracting policies/procedures for the project, to include acquisition strategy.

Acquisition Reviews: Conduct acquisition reviews, to include Biddability, Constructability, Operability and Environmental Review (BCOE).

Development of Contract Documents: Develop contract documents for preconstruction requirements, to include AE and Environmental Task Order.

Data Needs Labor Cost For CESAW-CT	\$10,000
Required Analysis Labor Cost For CESAW-CT	\$20,000
Analysis Of Alternatives Labor Cost For CESAW-CT	\$20,000
Alternative Selection Labor Cost For CESAW-CT	\$20,000
TOTAL HIRED LABOR COST FOR CESAW-CT	\$70,000

PROJECT MANAGEMENT PLAN
FEASIBILITY PHASE
DARE COUNTY BEACHES
(HATTERAS AND OCRACOE ISLANDS)
SHORE PROTECTION
APPENDICES

Appendix C
Detailed Scope of Work
U.S. Army Corps of Engineers
Wilmington District
Project Management Branch

Appendix C

Detailed Scope of Work

U.S. Army Corps of Engineers, Wilmington District, Project Management Branch
(CESAW-PM-C)

Project Management Business Process

Role of the Project Manager: The Project Manager, working under direction of the Deputy District Engineer for Programs and Project Management (DDEPM) and working within the Project Management Business Process (PMBP) as described in Engineer Regulation (ER) 5-1-11, *U.S. Army Corps of Engineers Business Process*, dated 17 August 2001, has overall responsibility for project scope, quality, schedule, budget and cost. The PM will retain project management responsibilities throughout all phases of the project development for Dare County Beaches (Hatteras and Ocracoke Islands) Project; however, the following specific elements will pertain to the scope and cost of the feasibility phase.

Prepare the Project Management Plan: Prepare the Project Management Plan (PMP), which includes a baseline cost estimate and schedule. Coordinate endorsement and approval of the PMP with the project delivery team (PDT). Present and defend the PMP as required.

Maintain the Project Management Plan: Maintain the PMP to include the baseline cost estimate, reflective of approved changes to support the scope, quality, schedule, estimated construction costs and estimated budgets for production.

Project Resource Utilization: Manage actual project resource utilization and progress to ensure compliance with the PMP, and in particular, the established commitments that we make to our customer. Manage project contingencies to ensure effective utilization of project funds. Prepare and obtain approvals for project cost increase requests to higher authority as required.

Issue Resolution: Identify project related issues impacting scope, quality, cost, budget and schedule. Facilitate issue resolution through the Project Review Board (PRB), while keeping commitments to the customer in focus.

Project Management Reporting: Prepare and distribute required project management reports. Present a project executive summary at monthly PRB meetings.

Project Review: Participate in review of and provide comments on all project documents for consistency with commitments, policy, regulation, and guidance prior to submission to the customer, higher authority, or outside agencies.

Negotiation of the Feasibility Cost Sharing Agreement and Project Cooperation Agreement: Lead negotiations for and prepare the feasibility cost share agreement as well as the Project Cooperation Agreement (PCA) that is required for the construction phase.

Ability to Pay Analysis: Prepare an ability to pay analysis as per the requirements of ER 1105-2-100, *U.S. Army Corps of Engineers, Planning Guidance Notebook*, dated 22 April 2000, and the provisions of the Water Resources Act (WRDA) 1986. The analysis will determine the sponsor's eligibility to meet their cost sharing responsibilities based on local economic conditions. Prepare a Financial Analysis Report.

Financial Analysis Report: A financial analysis report consists of the sponsor's statement of financial capability, their preliminary financing plan, and the District Commander's assessment of the sponsor's financial capability. The financing plan will include: a current schedule of estimated federal and non-federal costs, by fiscal year; a schedule of the sources and uses of non-federal funds during and after construction, by fiscal year; and the method of finance for all non-federal outlays associated with the feasibility study.

Financial Capability of the Sponsor: The District Commander's assessment of the sponsor's financial capability will determine if it is reasonable to expect that funds will be available to satisfy the sponsor's financial obligations for the project. Consideration is given to prior performance of the sponsor on similar projects, certainty of revenue sources and method of payment, and the overall financial position of the sponsor. The assessment will demonstrate: (1) that the sponsor has adequate funds to meet its financial obligations as delineated by the project funding schedule provided by the Corps; (2) that the reliability of the sources of funds has been demonstrated; (3) that the sponsor has full and legal access to those funds; and (4) that all the parties providing funding essential to meeting the sponsor's financial obligation are legally committed to providing those funds.

Funds Control: The Project Manager is responsible for the preparation and management of internal funds control documents for the allocation to and management of the project.

Management of Study Costs and Schedules: The PM is responsible for managing the overall study costs, schedule, preparing present and future budget year submissions, and conducting fiscal coordination with the sponsor. A representative of the sponsor will assist in project management. The Wilmington District PM, with assistance by the sponsor's project manager, will report status and issues to the District Engineer and the Project's Executive Committee. The project management structure will continue into the Construction phase. Updates to the PMP will include monthly finance and accounting reports regarding expenditures and obligations, executive summary reports for the Project Review Board (PRB), schedule and cost changes, and changes to work elements.

Preparation of the Project Cooperation Agreement: The PM is responsible for the preparation of the Project Cooperation Agreement (PCA). The PCA documents the cost sharing and relative roles and responsibilities for the project, and contains an analysis of the sponsor's ability to meet its responsibilities under the terms of the PCA during the construction and Operations, Maintenance, Repair and Rehabilitation.

Data Needs Labor Cost For CESA-W-PM-C	\$150,000
Required Analysis Labor Cost For CESA-W-PM-C	\$250,000
Analysis Of Alternatives Labor Cost For CESA-W-PM-C	\$200,000
Alternative Selection Labor Cost For CESA-W-PM-C	\$200,000
 TOTAL COST FOR CESA-W-PM-C	 \$800,000

PROJECT MANAGEMENT PLAN
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Appendix D
Detailed Scope of Work
U.S. Army Corps of Engineers
Wilmington District
Programs Management Branch

Appendix D

Detailed Scope of Work

U.S. Army Corps of Engineers, Wilmington District, Programs Management Branch
(CESAW-PM-P)

Budget Data Submission

Budget Preparation, Submission and Defense: The Programs Management Branch, working under the direction of the Deputy District Engineer for Programs and Project Management (DP), has overall responsibility for the preparation, submission, and defense of the budget data for the project. The following specific elements pertain to the scope and cost of the Pre-construction, Engineering and Design phase.

- Prepare and submit, with input from the functional elements and the project manager, all budget data and supporting documentation.
- Present and defend the funding requirements to higher authority and the Congress.
- Monitor project execution and funding requirements to assure that the necessary funds are available to keep the feasibility phase on schedule.
- In conjunction with the project manager, determine causes for deviations from the schedule and participate in implementing corrective actions or modifying project schedules as appropriate.
- Communicate with congressional interests concerning funding requirements and capabilities for the feasibility phase.

Data Needs Labor Cost For CESAW-PM-P	\$50,000
Required Analysis Labor Cost For CESAW-PM-P	\$25,000
Analysis Of Alternatives Labor Cost For CESAW-PM-P	\$25,000
Alternative Selection Labor Cost For CESAW-PM-P	\$25,000
 TOTAL HIRED LABOR COST FOR CESAW-PM-P	 \$120,000

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Appendix E
Detailed Scope of Work
U.S. Army Corps of Engineers
Wilmington District
Construction Branch

Appendix E
Scope of Work

U.S. Army Corps of Engineers, Technical Services Division,
Construction Branch (CESAW-TS-C)

Biddability, Constructability, Operability Review: This scope includes all Phases of work and work elements necessary to conduct the required biddability, constructability, operability review for the separate contracts for this project. It also includes costs for the supervision and administration during the construction contract period.

Data Needs Labor Cost For CESAW-TS-C	\$20,000
Required Analysis Labor Cost For CESAW-TS-C	\$20,000
Analysis Of Alternatives Labor Cost For CESAW-TS-C	\$20,000
Alternative Selection Labor Cost For CESAW-TS-C	\$20,000
TOTAL HIRED LABOR COST FOR CESAW-C	\$80,000

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Appendix F
Detailed Scope of Work
U.S. Army Corps of Engineers
Wilmington District
Coastal Section

Appendix F

Detailed Scope of Work

U.S. Army Corps of Engineers, Wilmington District, Technical Services Division, Engineering
Branch, Coastal Section (CESAW-TS-EC)

Aerial Photo Data Base (Project Engineer)

- Bodie Island
- Pea Island
- Hatteras (North Cape Point)
- Hatteras (South Cape Point)
- Ocracoke Island

Comparison of Historic Maps and Charts

- Bodie Island
- Pea Island
- Hatteras (North Cape Point)
- Hatteras (South Cape Point)
- Ocracoke Island
- Analysis of Map Data

Sound Shoreline Changes (Comparison of Historic Maps and Charts)

- Bodie Island
- Pea Island
- Hatteras (North Cape Point)
- Hatteras (South Cape Point)
- Ocracoke Island
- Analysis of Map Data

Inlet Dynamics

- Oregon Inlet
- Update Inlet Position Changes
- Compute Inlet Volume Changes
- Update Dredging History
- Hatteras Inlet
- Determine Inlet Position Changes
- Compute Inlet Volume Changes
- Determine Dredging History
- Ocracoke Inlet
- Determine Inlet Position Changes
- Compute Inlet Volume Changes
- Determine Dredging History
- Analyze Inlet Data

Profile Data (I per mile)

Fixed Cost

Beach Profile Sand Samples (Geotechnical)

Storm Characteristics (Ocean and Sound)

- Ocean Storms
- Evaluate and select stage frequencies for the various sites
- Determine storm wave characteristics (heights and periods)
- Compile information of typical storm surge hydrographs
- Sound Storms
- Evaluate and select stage frequencies for the various sites
- Compile information of typical storm surge hydrographs

Normal Wave Characteristics

- Evaluate normal wave characteristics of all ocean beaches [Wave Information Studies (WIS), National Oceanic and Atmospheric Administration (NOAA), and Field Reach Facility - Duck Pier (FRF)]
- Compute longshore sediment transport potential for each data base (sediment transportation model)
- Select appropriate wave characteristics for use in shore process analysis

Wave Transformation Analysis [Regional Coastal Processes WAVE propagation model (RCPWAVE) Model]

- Develop depth grid for offshore areas
- Junior Engineer
- Senior Engineer
- Run RCPWAVE for various shoreline reaches
- Establish data files for Generalized Model for Simulating Shoreline Change GENESIS Model

Sediment Budget/Shoreline Response Modeling

Calibrate GENESIS using measure shoreline change and RCPWAVE results.

Develop sediment budget linking island and inlet littoral cells

Storm Induced Shoreline Change

- Categorize ocean beach profiles
- Compute storm erosion potential for a range of storm conditions for each category of beach profile
- Estimate overwash potential
- Determine areas where inlet breaching is possible

Evaluation of Coastal Engineering Alternatives

- Beach Fill Design (dependent on the results of the erosion modeling and geologic framework; assume 3 sites)
- Alternatives involving structures combined with beach fill

Report preparation

Miscellaneous (copying, materials, reproduction, etc.)

S&A

Data Needs Labor Cost For CESAW-TS-EC	\$205,198
Required Analysis Labor Cost For CESAW-TS-EC	\$432,064
Analysis Of Alternatives Labor Cost For CESAW-TS-EC	\$123,918
Alternative Selection Labor Cost For CESAW-TS-EC	\$19,516
TOTAL HIRED LABOR COST FOR CESAW-TS-EC	\$780,696

PROJECT MANAGEMENT PLAN
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Appendix G
Detailed Scope of Work
U.S. Army Corps of Engineers
Wilmington District
Design Section

Appendix G Detailed Scope of Work

U.S. Army Corps of Engineers, Technical Services Division, Engineering Branch,
Design Section (CESAW-TS-ED)

In general this office is responsible for development of civil/structural alternative designs (excluding beach nourishment and dune work which will be developed by TS-EC)

Design work for this office will generally not begin until after concurrence point 3 is reached; however, attendance in various meetings and site visits may be needed before this time to better define the scope of work during and after erosion analysis and other investigations have been completed by others.

Alternatives 4 & 5

As discussed in Appendix K, Alternatives 4, and 5 should be accomplished by NCDOT; therefore, TS-ED effort for these elements are assumed to be limited to coordination, reviews, compilation of the appendix and development of the narrative.

Alternative 1

Alternative 1 would generally shift the existing roadway to the west as well as raising the grade. This work could be accomplished by NCDOT; however, this scope of work assumes that much of this work will be done in-house. At this time, the reaches that will be addressed by this alternative are not well defined. They could vary from “hot spot” relocations at various places to relocations along long reaches of the highway, possibly combined with the Alternative 5 – Build Bridges.

Data Needs Labor Cost For CESAW-TS-ED	\$10,000
Required Analysis Labor Cost For CESAW-TS-ED	\$10,000
Analysis Of Alternatives Labor Cost For CESAW-TS-ED	\$30,000
Alternative Selection Labor Cost For CESAW-CT TS-ED	\$30,000
TOTAL HIRED LABOR COST FOR CESAW-TS-ED	\$80,000

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Appendix H
Detailed Scope of Work
U.S. Army Corps of Engineers
Wilmington District
General Engineering Section

Appendix H

Detailed Scope of Work

U.S. Army Corps of Engineers, Wilmington District, Technical Services Division, Engineering Branch, General Engineering Section (CESAW-TS-EE)

GIS Coordination for Dare County Beaches, Ocracoke and Hatteras

DATA NEEDS - Determine data needs, data gaps, identify studies to fill needed gaps, prepare detailed scopes of work to accomplish needed studies and surveys, identify costs of needed studies and surveys, and assign tasks to appropriate elements.

- Determine Data Available from Existing Sources
 - Over 50 GIS data layers have been identified as essential in a preliminary assessment of the project. It will be necessary to (1) determine how many of these data layers are available from existing sources, (2) obtain available data from the source, (3) format the data into Spatial Data Standards for Facilities Infrastructure and Environment (SDSFIE), (4) document the data with FGDC compliant metadata, and (5) load data layers into a Geodatabase. (1340 hrs)
- Determine Data Gaps Which Exist In Data Available from Existing Sources
 - A determination of data gaps can be made once the Geodatabase of exiting data has been created. The existing data layers will be compared to the project area(s) to determine where data gaps exist. A large part of this analysis should be performed by each of the specialized disciplines involved in the project. However, it will be necessary to provide Geodatabase access to those with as well as those without GIS software. Accomplishing this task will require serving the Geodatabase over the Intranet via ArcIMS. (320 hrs)
- Determine Additional Data Requirements
 - Most of the additional data requirement assessment will be performed by the specialized disciplines involved in the project. However, it will be necessary for the GIS Help Center to provide support during this phase of the project. (160 hrs)
- Write Scopes of Work for Acquiring Additional Data
 - The GIS Help Center will provide technical support and language for format of the data to be delivered. (80 hrs)

REQUIRED ANALYSIS- Perform needed studies, describe in depth, problem, needs, and opportunities, establish specific goals and objectives for further study establish methodology and identify cost and responsibilities for implementation

- The GIS Help Center will provide technical assistance to those specialized disciplines performing analysis of the data. The GIS Help Center will be responsible for checking all data and metadata deliverables to ensure they are SDSFIE and FGDC compliant. It will also be necessary to manage both the Geodatabase and the Intranet server.

ANALYSIS OF ALTERNATIVES - Develop alternatives to meet objectives and determine outputs and impacts associated with each alternative, and perform trade off analysis.

- Analysis of Alternatives
 - The GIS Help Center will provide technical assistance to those specialized disciplines performing analysis of the data. The GIS Help Center will be responsible for checking all data and metadata deliverables to ensure they are SDSFIE and FGDC compliant. It will also be necessary to manage both the Geodatabase and the Intranet server.

ALTERNATIVE SELECTION - Select recommended plan (either Net Economic Development (NED) Plan and/or locally preferred plan) produce feasibility report and draft Environmental Impact Statement

- The GIS Help Center will provide technical assistance to those specialized disciplines performing analysis of the data. The GIS Help Center will be responsible for checking all data and metadata deliverables to ensure they are SDSFIE and FGDC compliant. It will also be necessary to manage both the Geodatabase and the Intranet server.

Data Needs Labor Cost For CESA-W-TS-EE	\$153,900
Required Analysis Labor Cost For CESA-W-TS-EE	\$84,240
Analysis Of Alternatives Labor Cost For CESA-W-TS-EE	\$84,240
Alternative Selection Labor Cost For CESA-W-TS-EE	\$84,240
TOTAL HIRED LABOR COST FOR CESA-W-TS-EE	\$406,620

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Appendix I
Detailed Scope of Work
U.S. Army Corps of Engineers
Wilmington District
Geotechnical and Environmental Remediation Section

Appendix I

Detailed Scope of Work

U.S. Army Corps of Engineers, Technical Services Division, Engineering Branch,
Geotechnical and Environmental Remediation Section (CESAW-TS-EG)

DATA NEEDS

This item includes the labor to determine data available, the gaps in the data, additional data requirements, and writing scopes for acquiring additional data. The research item contains the hired labor to consult with local University Geology Departments and other government agencies, to research existing geotechnical information in the south Dare County area, and to assess the existing Corps information to determine the best areas to search for additional borrow material. It also includes analyzing the additional data needs, administrative tasks to prepare for the accomplishment of the physical work, and preparation of contracts.

REQUIRED ANALYSIS

Geophysical Investigation. Geophysical surveys will be performed to delineate likely locations for further borrow area studies, assist in the location of vibracore borings, and demonstrate the continuity and thickness of the layers of suitable material between vibracore boring locations. Chirp sonar or high-resolution seismic reflection will be used to provide a great resolution for shallow depths.

Primary survey lines will be run parallel to the shoreline in an attempt to define the locations of the old ebb-tidal deltas. Secondary cross lines will tie the primary lines together for continuity. These deltaic deposits are usually composed of materials of suitable grain size for beach nourishment. Using these results, borrow areas will be selected in the vicinity of the areas needing nourishment.

The contractor performing the work will process all the data and submit a report complete with maps, profiles, and sections of the areas investigated. This information will then be used as a guide in selecting locations for borings and eventually, the borrow areas. Approximately 15 square miles of geophysical investigations will be performed at each of six "hot spots" to supplement existing information. Also, a line of geophysical surveys will be run the length of the island. This line will be run on the sound side of the island as access permits.

The geophysical work item includes the cost for the mobilization and demobilization of the vessel, and the time for the vessel to perform the geophysical work, the equipment and labor to perform the geophysical work, hired labor for the onboard inspection of the geophysical work, and travel and per diem for the inspectors. Also it includes data interpretation and analysis, and report write up and review.

Surface surveys will also be performed during this stage of the work.

Subsurface Investigation. These items of work include all of the associated tasks to plan and perform the subsurface investigation.

Hired Labor. This item of work includes all of the associated hired labor tasks to plan and perform the subsurface investigation. Included are the research of historical information,

layout of the borings, administrative tasks to prepare for the accomplishment of the physical work, preparation of contracts, inspection of the drilling, logging of the cores and preparation of the samples for testing, preparation of the drill records, per diem and supervision.

The research item contains the hired labor to consult with local University Geology Departments and other Government Agencies, to research existing geotechnical information in the South Dare County area, and to assess the existing Corps of Engineers information to determine the best areas to search for additional borrow material.

The engineering analysis includes sizing the borrow areas and determining the volume of useable material in each area.

The costs for the preparation of purchase request and commitments, administrative and contracting time includes the preparation of travel orders, travel vouchers, purchasing vibracore tubes, and the preparation of the scopes or work drilling and lab testing.

The logging of the cores includes the hired labor to open the vibracore tubes, describe the sampled soils, place representative samples of the material in plastic jars, and prepare the samples for transfer to the testing lab.

Preparing the boring logs includes the cost of all hired labor for creating the final logs, including the generation of the logs, the incorporation of the lab data on the logs, review of the logs by the project geotechnical engineer and the incorporation of corrections on the logs.

The costs cover all costs related to Geotechnical Section items of work. They also include the cost of supervision of Geotechnical Section, but do not include any supervision for Engineering Branch or Technical Services Division.

Marine Splitspoon Drilling. Splitspoon borings will be contracted to an engineering consultant. The splitspoon drilling item includes the cost for the mobilization and demobilization of a work barge and the drill machine, and the time for the equipment to perform approximately 15 continuous splitspoon borings to a depth of 50 feet and two borings for undisturbed samples to a depth of 50 feet at each of two proposed groin locations, approximately two continuous splitspoon borings to a depth of 100 feet, 10 continuous splitspoon borings to a depth of 50 feet, and two borings for undisturbed samples to a depth of 50 feet, along the alignment of each of the six proposed bridge locations, approximately 10 continuous splitspoon borings to a depth of 50 feet, and two borings for undisturbed samples to a depth of 50 feet, along the alignment of each of the six proposed road relocations, approximately five continuous splitspoon borings to a depth of 45 feet at each of the possible new or improved ferry slip locations, providing the associated supplies, hired labor for the onboard inspection of the splitspoon sampling, and travel and per diem for the inspectors. It is expected to take 260 days to perform the borings, and 70 additional days are included for weather. It is expected that approximately 9,352 disturbed soil samples and 58 undisturbed soil samples will be obtained.

Marine Vibracore Drilling. This item of work includes the plant and labor necessary to perform the vibracore borings, and the associated supplies to execute the work. The borings will be performed with the SNELL using a 3 7/8 inch diameter Alpine vibracore drill machine. It is planned to drill 30, 20-foot borings, in each of the six proposed borrow areas. It is planned to drill 15, 20-foot borings, in the vicinity of the alignment of each of the proposed causeway locations and along any connecting channels. It is planned to drill 300, 20-foot borings, in the vicinity of the alignment of each of the possible new or improved ferry slip locations and along

any connecting channels. It is expected to take 70 days to perform the borings, and 33 additional days are included for weather and travel between sites. Each tube is expected to have approximately six soil samples, for a total of 3,420 samples.

Land Split spoon Drilling. Land split spoon drilling is not necessary and will not be performed as a part of the subsurface investigation for this project. No costs for this work item are included in this project.

Beach and Near Shore Grab Samples. This item of work includes the plant and labor necessary to obtain the beach and near shore native material grab samples, and the associated supplies to execute the sample collection. It also includes the grain size testing, visual lab classifications, and preparation of testing reports for the samples taken from the beach and near shore areas. The beach grab sampling consists of taking 20 soil grab samples along each of 21 transects over approximately five miles of beach at each of two hot spots (Oregon Inlet to Ocracoke Inlet) . It includes the lay out of transects and the locating of the sampling points. It also includes performing grain size testing on approximately 2,520 soil grab samples. This information will be used to determine the “native” beach material grain size for comparison with the borrow area material.

Lab Testing. This item of work includes grain size testing, percent shell content, percent silt content, visual lab classifications, and preparation of testing reports for the samples taken from drilling. Approximately 1,080 proposed borrow area and 2,340 general alignment vibracore soil samples, 935 representative samples from the split spoon borings, and 2,520 beach grab samples are to be tested. These samples will be tested for grain size, silt content, shell content in accordance with ASTM D 422 using a minimum of 12 sieves. Samples will be classified in accordance with the Unified Soils Classification system. Triaxial and consolidation tests will be performed on the 58 undisturbed samples obtained at the location of the proposed groin.

Analysis. This item of work includes the hired labor to analyze the data collected from the subsurface investigation, perform the compatibility analysis of the beach and near shore material, and the borrow area material, and prepare the report, including the drawing preparation.

ANALYSIS OF ALTERNATIVES

NC Hwy 12 – Alternative 1 Periodic Relocation of Road

This item of work includes the hired labor to perform the Geotechnical design of this alternative and to support other sections in the preparation of the design.

NC Hwy 12 – Alternative 2 Build Bridges

This item of work includes the hired labor to perform the geotechnical design of this alternative and to support other sections in the preparation of the design.

NC Hwy 12 – Alternative 3
Beach Nourishment

This item of work includes the hired labor to perform the geotechnical design of this alternative and to support other sections in the preparation of the design.

NC Hwy 12 – Alternative 4
Beach Nourishment with Groin at Ocracoke

This item of work includes the hired labor to perform the geotechnical design of this alternative and to support other sections in the preparation of the design.

NC Hwy 12 – Alternative 5
Relocation of Ocracoke Ferry

This item of work includes the hired labor to perform the geotechnical design of this alternative and to support other sections in the preparation of the design.

NC Hwy 12 – Alternative 6
Community Buy-out and Relocation
Geotechnical analysis is not applicable to this alternative.

ALTERNATIVE SELECTION

Report Preparation. This item of work includes the hired labor to prepare the report, including the drawing preparation. The review portion of the costs includes the hired labor for Geotechnical Section for the review, development of comments and incorporation of the accepted comments into the report from the project, Independent Technical Review (ITR), and BCOE review, and agency comments.

There is a 10 percent contingency included in this estimate to cover the unknown additional costs that may not have been considered in this estimate and to provide for additional costs due to weather related delays of the field work.

Data Needs Labor Cost For CESA-W-TS-EG	\$44,000
Required Analysis Labor Cost For CESA-W-TS-EG	\$2,704,805
Analysis Of Alternatives Labor Cost For CESA-W-TS-EG	\$96,800
Alternative Selection Labor Cost For CESA-W-TS-EG	\$91,804
 TOTAL HIRED LABOR COST FOR CESA-W-TS-EG	 \$3,037,409

PROJECT MANAGEMENT PLAN
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Appendix J
Detailed Scope of Work
U.S. Army Corps of Engineers
Wilmington District
Environmental Resources Section

Appendix J

Detailed Scope of Work

U.S. Army Corps of Engineers, Wilmington District, Technical Services Division, Planning
Branch, Environmental Resources Section (CESAW-TS-PE)

Plan Formulation

Resource Definition & Problem Identification: A scoping letter describing the potential project alternatives currently under consideration will be prepared and furnished to federal, state, and local agencies as well as all other known interested parties. Scoping meetings will also be conducted as needed. Comments and concerns will be considered and discussed or addressed as appropriate in the study.

Study-team Participation Coordination: Interaction with other members of the study team will be required to provide input relative to plan formulation to minimize or avoid environmental impact and to keep abreast of modifications and refinements during plan development. Weekly meetings will be attended by the project biologist. The Corps and USFWS biologist will attend monthly meetings. It is anticipated that many of the monthly meetings will also require attendance by the Environmental Resources Section Chief. All plans would be analyzed for enhancement opportunities and potential for implementation of plan elements under the Coastal America Program, National Waterfowl Management Plan or other environmental initiatives. Interagency and public coordination would be maintained so that we can address their concerns in planning process.

Determine Construction Window: The most appropriate time of year for construction activities will be determined during feasibility level studies. The schedule will be based on an analysis of environmental and engineering factors. Factors to be considered include the location and scope of the potential action, presence and vulnerability of significant resources and physical factors that may impair or preclude a particular construction activity such as wave climate during a particular time of the year. The results of this analysis would require interagency coordination to arrive at an acceptable construction window.

Cultural Resource Inventory

Cultural Resources: Consultation, literature, and records review will be conducted to determine what cultural resources are known or considered likely to be located within the study area, and to appraise the type, extent, and validity of past surveys. The staff and files of the State Historic Preservation Officer (SHPO) will be consulted prior to the initiation of fieldwork to assure that all known shipwreck locations are listed in the survey report. Archeological surveys of proposed offshore borrow areas and shoreline nourishment areas will be required during feasibility level studies. Diver investigations of discovered suspect targets will be required of all discovered anomalies that are suspected of representing shipwreck sites. If significant resources are encountered they will be avoided, or a data recovery plan will be implemented to mitigate any adverse impacts. Pedestrian survey may be required over upland (beach) areas to identify recently exposed and redeposited shipwreck remains and magnetometer and side-scan sonar survey will be required over the off-shore areas. Structures, properties, or archaeological sites eligible for or listed in the National Register of Historic Places within the project area of Potential Effect will be inventoried.

Biological Resources

Marine Resources: Potential borrow area will be investigated to assure that existing hardbottom areas are not present. These investigations would include analysis of bathymetric survey data and side-scan sonar data collected during underwater surveys. Underwater video coverage of suspected hardbottom areas would be made for confirmation and documentation as needed. The contractor would prepare a brief report with mapping to depict significant hardbottom areas. Existing data on striped bass wintering habitat will be analyzed and their status in proposed project areas will be determined. Existing GIS database regarding striped bass CPU'S will be updated with any information collected since it's preparation. This work would be conducted by the USFWS. Literature review is required to determine the status of larval, ocean spawning, and estuarine dependent fish in the nearshore ocean portion of the project area. A species list will be prepared noting the degree of commercial or recreational importance, relative abundance in potential project areas and identifying potential keynote indicator species. Limited sampling for aggregations of these species may be made if this information is not available in the existing scientific literature. Existing National Marine Fisheries Service (NMFS) turbidity threshold limits will be identified for several keynote species. Additional laboratory investigations may be needed to determine threshold limits for some northern species. This work will be conducted by contract.

Estuarine Resources: Existing mapping of important estuarine habitat including shellfish and sea grass beds will be reviewed to determine coverage in potential impact areas. In uncharted areas sea grass and shellfish beds will be mapped. Field investigations may include sampling for coverage or abundance by species and site location using GPS. Resulting mapping will be completed using NAD 83 datum in North Carolina State Plane feet. All mapping will be done in GIS using ArcView 3.x or greater.

Endangered Species: Surveys will be required to determine the status of *Amaranthus* in the project area. The status of other threatened or endangered species will be determined by detailed review of existing data. The status of piping plover in the study area will be evaluated by a proposed statewide piping plover study. A portion of the statewide survey would be funded by this project.

Terrestrial Resources: Sand compatibility analysis will be performed based on review of grain size, shell and silt content of borrow area sands relative to potential beach disposal areas. Detailed shore process analyses will also be done to determine potential impacts of placing offshore and inlet borrow material on the nearby shorelines will be conducted. Data from this analysis will be analyzed to assure that the material is environmentally suitable for beach fill and assess the impacts of any shoreline changes on fish and wildlife resources. The use of potential project areas by colonial nesting seabirds will be determined. General data on seabirds in the project area will be available from the statewide piping plover study. Existing mapping of important terrestrial habitat including wetlands, maritime forest and dune will be reviewed to determine adequacy and coverage in potential impact areas. In uncharted or inadequately mapped areas these habitats will be located using GPS. There will be limited field surveys to document keynote plant and animal species present. Resulting mapping will be completed using NAD 83 datum in North Carolina State Plane feet. All mapping will be done in GIS using ArcView 3.x. Literature review and limited sampling will be used to prepare floral and faunal descriptions.

Impact Assessment

Biological Resources: Impacts of potential bridge or causeway construction, dredge pipeline routes and beach disposal on terrestrial resources will be determined. Potential impacts to marine and estuarine species will be evaluated, including effects on inter-tidal organisms, benthic communities and various life phases of fish by construction of structures, dredging and disposal activities. Potential impacts to endangered species will be determined and coordinated with U.S. Fish and Wildlife Service and the National Marine Fisheries Service. The potential impacts of dredging in Oregon Inlet and offshore borrow sites on the littoral sediment budget and corresponding impacts on adjacent beaches and associated fish and wildlife resources, would be documented based on data generated by Coastal Engineering Section.

Cultural Resources: Diver investigations of discovered suspect targets will be required of all discovered anomalies that are suspected of representing shipwreck sites that cannot be avoided during project construction. If significant resources are encountered which cannot be avoided, implementation of a data recovery plan to mitigate any adverse impacts will be required. Effects of alternatives on land-based cultural resources will also be determined.

Human Resources: Recreational and esthetic resources survey will be done based on current procedures and practices. State requirements for vehicular parking and pedestrian access points will be included in the analysis. Potential project impacts on public use of beach area and local transportation will be determined.

Required Documentation

GIS Data Base: A GIS database will be developed using standard database and geographic software. Task would include data acquisition and input of data, database management, analysis and production of map products to support report preparation.

Environmental Impact Statement (EIS): An EIS to document all project-related environmental concerns would be prepared in accordance with NEPA. The EIS would be coordinated during a 45-day (draft) public review and comment period, revised, and coordinated as a final EIS for a 30-day review and comment period.

Clean Water Act Compliance: A Section 404 (b)(1) evaluation would be prepared for beach disposal of dredged material or other fill in wetlands or waters of the United States as required by the Clean Water Act (PL 95-217) and included with the EIS. Also a Section 404 public notice and an application for a Section 401 water quality certification would be prepared and coordinated.

Consistency Determination: A consistency determination, as required by the Coastal Zone Management Act of 1972 (PL 92-583), will be prepared and included in the EIS.

Biological Assessment: A biological assessment (BA) on impacts on threatened and endangered species will be prepared and coordinated with the USFWS in accordance with the Endangered Species Act of 1973, as amended.

Fish and Wildlife Coordination Act Report (FWCA Report): The U.S. Fish and Wildlife Service will address fish and wildlife concerns and prepare a Planning Aid Report and a draft and final FWCA report. Attendance at monthly team meetings will be required.

Record of Decision (ROD): A Record of Decision (ROD) would be prepared and signed prior to advertising for construction bids.

Data Needs Labor Cost For CESAW-TS-PE	\$182,289
Required Analysis Labor Cost For CESAW-TS-PE	\$1,046,121
Analysis Of Alternatives Labor Cost For CESAW-TS-PE	\$433,085
Alternative Selection Labor Cost For CESAW-TS-PE	\$390,041
TOTAL HIRED LABOR COST FOR CESAW-TS-PE	\$2,051,536

PROJECT MANAGEMENT PLAN
FEASIBILITY PHASE
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APPENDICES

Appendix K
Detailed Scope of Work
U.S. Army Corps of Engineers
Wilmington District
Planning Services Section

Appendix K

Detailed Scope of Work

U.S. Army Corps of Engineers, Wilmington District, Technical Services Division, Planning Branch, Planning Services Section (CESAW-TS-PS)

Introduction

Alternatives: The following alternatives have been assumed. Actual alternatives will depend on the problems identified through erosion modeling and determination of the area's geologic framework.

- | | |
|----------------|--|
| Alternative 1. | Periodic Relocation of Road |
| Alternative 2. | Beach Nourishment |
| Alternative 3. | Beach Nourishment with Groin at Ocracoke Ferry |
| Alternative 4. | Relocation of Ocracoke Ferry |
| Alternative 5. | Build Bridges |
| Alternative 6. | Community Buy-out and Relocation |

Degree of Analysis of Alternatives: Other alternatives may be determined which have merit; however, all alternatives will not be studied to the same degree. Additionally, some alternatives may not be implementable under the current Corps authorities. Some alternatives would be better suited to be studied through NCDOT and their transportation contractors. This would be true of alternatives 1, 4, and 5. The Corps could manage these contracts but it would probably make more sense for NCDOT to take the "in kind" credit for their management since it is more their area of expertise and they are more familiar with the best contractors.

Report Preparation: Using the nomenclature from the OBTF report, Planning Services Section (CESAW-TS-PS), will be responsible for overseeing to completion each of the following work items for each the identified alternatives: (1) Economic and Social Studies; (2) Transportation Studies; (3) Plan Formulation; (4) Impact Analysis; and (5) Report Preparation/Documentation.

Grouping of Alternatives for Analysis: The analysis required for each alternative is anticipated to vary based on the effort required to complete the tasks for each alternative listed above. Alternatives that require similar or common analyses shall be grouped together and analyzed as a group. Alternatives that do not appear to be economical, engineering, or politically viable, after initial investigation, will be not be subjected to further extensive study. Alternatives that are related to traditional NCDOT analysis will require input from NCDOT before a meaningful scope of the required efforts can be determined.

Economic and Social Studies

Identify Problems And Opportunities Common to All Alternatives: After several site visits and interviews with key NCDOT and local officials, as well as some randomly selected local citizens, a thorough explanation of the region's problems associated with storm damages and erosion will be documented. This item will also include accounts of historic storm damages, other studies underway, and protective measures taken. In addition, the objectives of the study will be clearly presented.

Identify the Study Area Common to All Alternatives: This item includes participation in meetings with the sponsor to define the scope of the study relative to the physical limits of the

study area. As the limits of the overall study area are defined based on input from the local sponsor, it will probably be necessary to designate secondary study areas within the overall study area. The results of previous studies in the study area will be summarized. In addition, the availability of adequate public access and pertinent socioeconomic data for the study area will be profiled. This item includes participation in meetings with the sponsor

Establish the Without Project Condition, Common to All Alternatives: The all-important without project condition will be identified for the base year and 50 years beyond. The major task will be computing the expected annual damages over the 50-year period of analysis. The various long-term erosion rates and their impact on development will be examined. The future without project condition involves analyzing the most likely actions the local governments and other interests might take in lieu of a project, as well as during the immediate pre-project years.

Prepare the Highway/Structure File. Structures such as NC Hwy 12, existing bridges, and ferry terminals, that are threatened, will be located and illustrated on suitable base maps using the most recent orthophotography of the study area. Data to be gathered on the highway includes value, width, elevation, damage susceptibility, and distance from the ocean reference line. Data to be gathered on any structures included in the study area includes the street address, front and back coordinates of the structure, lot size, ground elevation, first floor elevation, type, and tax value. An ASCII database file of all section of the highway and threatened structures in the study area will be created. This procedure involves cross referencing structure by structure between the Dare and Hyde Counties tax records, which contain pertinent information on each structure, and files created from the digitized maps, which contain the distance from the ocean to the structure. This portion of the work could either be accomplished through a private firm contract or the efforts of a Corps economist and planner. If a contract is let, a Corps economist and planner will be responsible for managing this contract and refining the collected data. However, for the purposes of this scope, it is assumed that the Corps team would collect this data. Structural items of particular concern for the Corps economist include:

- Content values, which will consist of a fixed percentage of residential structural value to be determined through sampling, and a unique value with commercial buildings.
- Structure values, which will be adjusted from the tax values furnished by a contractor to reflect the appropriate replacement value less depreciation as called for in the regulations. This adjustment will be based on field checks and interviews with local real estate experts.
- Elevation data, including ground and floor elevations for a representative sample of structures, will be field checked for accuracy.
- Type of structure, a sample of which will be field checked for accuracy.
- Near shore land values, which will be estimated based on values of interior lots for the purpose of developing land loss benefits.
- Utility data, meaning empirical data on damage susceptibility of water, wastewater, and electrical distribution systems.
- Risk and uncertainty principles, meaning instead of developing a single, most likely value for a key variable or data component in planning and designing flood damage reduction

projects, risk and uncertainty analysis uses probability distributions to incorporate the amount of risk and uncertainty associated with each variable. The result is an analytical approach to combining the underlying risk and uncertainty into a framework that allows one to measure the overall engineering and economic performance and reliability of a potential project.

Transportation Studies

Determine Economic Value of Existing NC Hwy 12 Corridor. The existing and expected future carrying capacity of the present transportation system, i.e., the combination of NC Hwy 12, the Bonner Bridge, and the ferries, is the lifeline of the communities and accessibility of Cape Hatteras National Seashore. The baseline value of the transportation corridor to the area's economic and natural resources must be established before comparing alternative transportation systems. The experience of NCDOT and their contractors will be called on here for scoping and assessing transportation study needs.

ANALYSIS OF ALTERNATIVES

Economic and Social Studies

Model Existing Damages: The damage model, methodology, assumptions, and risk and uncertainty principles employed to arrive at the without project hurricane and storm damages will be explained thoroughly.

Develop Emergency Costs and Other Damage: This category of damages prevented refers to expected annual expenditures that residents and governments will experience under the without project condition that a project would preclude. These kinds of damages and expenditures represent financial impacts on public and private storm victims that are not covered under the National Flood Insurance Program, but that a large beach nourishment project could prevent. These emergency costs and other damages prevented include: (1) beach scraping/pushing; (2) sandbagging; (3) emergency costs incurred by the North Carolina Department of Transportation; (4) damages to public property; (5) damages to private property other than structures and contents; and, (6) post-storm recovery expenses. This data will be collected and analyzed by an economist or planner. Sources for the data include local governments, citizens, and contractors, NCDOT, Federal Emergency Management Agency (FEMA), and the electric company.

Nonstructural Plans (Community Buyout and Relocation) Common to Alternatives 7a and 12: For the purposes of this discussion, buyout refers to an evacuation program and relocation of a structure to another parcel of property. As long-term erosion approaches a structure, given the time, money, and an available alternate site, that structure can be relocated to safer ground, or it can be purchased with public funds, torn down and removed. Costs will be developed for these nonstructural plans and will be evaluated as structural plans; on their economics, engineering practicality, and political implement ability.

Develop Recreation Benefits Common to All Alternatives: A recreation analysis to determine the value of the existing recreation beaches of the Cape Hatteras National Seashore (CHNS) will be conducted. Impacts to the number of visitors and/or existing value of recreation stemming from the array of alternative plans will be estimated using some combination of the unit-day value, travel cost, or contingent value methods. The unit-day value procedure used to estimate recreation benefits can be explained in the following four steps. First, the maximum daily visitation for each town will be estimated to determine the peak day usage for the entire study

area. Daily usage will then be compared to daily capacity. With no pre-existing visitation estimates of the CHNS beaches, the projected maximum daily visitation will be based on total occupancy of all the dwellings available to the beach users, plus filling all public parking spaces with turnover rate to be determined. Second, this maximum daily visitation will be used only for 4 July, traditionally the heaviest beach usage day of the year. Therefore, the rest of the beach season will be defined and daily visitation adjusted for weather and occupancy rates, with the bottom line being the estimated total beach visitation for the year. Next, the value of the improved recreation beach will be compared to the value of the without project beach using the unit-day value method. The unit-day method assigns a point value to various aspects of the recreation experience to determine the change in recreation values as a result of the project. Finally, the with and without project unit-day point difference will be converted to dollars and multiplied by the annual beach visitation to arrive at a recreation benefit attributable to the project. Other general discussions will include a thorough explanation of the federal requirement for adequate public access and parking.

Transportation Studies

Determine Most Economic Alternatives to NC Hwy 12 Corridor: The existing and expected future demands on the present transportation system, i.e., the combination of NC Hwy 12, the Bonner Bridge, and the ferries, must be weighed against the capacity of the alternative improvements to the system. Alternatives such as elevated causeways, tunnels, and expanding ferry operations will require lots of input from NCDOT. The NCDOT and their contractors are the experts here. Their assistance is needed on scoping and assessing transportation study needs.

Plan Formulation

Formulate Potential Plans Common to all Alternatives: This includes the time necessary to define the various alternatives to be investigated during the course of the study and the potential solutions that will be evaluated. The Planning Service Section will work closely with the coastal engineers during this stage which involves formulating the alternative plans of improvement and determining the expected annual damages associated with the various plans. Plans will include an array of beach berm with and without dunes, as well as a "no action" plan and a non-structural plan. A sufficient number of plans to identify the National Economic Development (NED) Plan will be evaluated. The expected annual benefits and net benefits of each plan will be determined. Benefits, which consist primarily of storm damage reduction, will be developed, checked, and explained thoroughly. Benefits will also include recreation and emergency costs reduction, both of which are described below.

Public Involvement Common to all Alternatives: This item includes preparation for and attendance at any public meetings scheduled to discuss plan formulation, study issues, and responding to the requests of Congressmen, reporters and the public for information on the study.

Identify the NED Plan, Locally Preferred, and Recommended Plans Common to All Alternatives: Each project alternative, length, and dimensions will produce net benefit results to be analyzed. During this task, the coastal engineer and economist will make many runs of the damage model. The NED Plan will be determined by the alternative project that maximizes net benefits. Upon arriving at a NED Plan, such refinements to benefits and costs such as transition zone benefits, benefits during construction, and interest during construction will be computed. The overall economics and effectiveness of the NED Plan will be summarized. At this point, the local sponsor may introduce a locally preferred plan. The locally preferred plan may be the plan that is ultimately recommended, but cost-sharing will be based on the NED Plan (i.e., same percentage

for smaller plans and locals pay 100 percent of the increase for larger plans). Both the planner and economist play a major role in identifying the NED Plan and determining the cost-sharing of any other plan.

Impact Analysis

Document Benefits and Costs Common to All Alternatives: There is considerable overlap with "impact analysis" and "economic and social studies." For the purposes of this discussion, impact analysis is done after ascertaining the results of the economic and social studies that would prevail under the with and without project conditions. These expected annual benefits and costs will be computed and totaled. In addition to those previously mentioned, future benefits and benefits during construction will be computed for the alternative plans. Future benefits will involve identifying vacant lots and projecting local development trends over recent years to account for the development that will take place during the pre-project years, as well as the 50-year project life. Zoning regulations and building code requirements will be taken into account. This will be done under both the with and without project conditions. Benefits during construction will use the most current construction schedule available to distribute the hurricane and storm damage reduction benefits and recreation benefits that accrue as the alternative plan is being built. Interest during construction, annual nourishment costs, and a total annual cost will be calculated for all of the alternatives.

Flood Damage Reduction Benefits: The National Economic Development (NED) benefits for flood damage reduction attributable to beach nourishment alternatives are calculated within the damage assessment model described above and include reducing losses of structures and land.

Direct Recreation Impacts Common to All Alternatives: The NED benefits for recreation improvements directly relate to any alternative implemented. The recreation benefits capture any additional willingness to pay for enjoying a higher quality of beach activities under the with project condition. The tools for measuring such qualitative differences are explained above in the "economic and social studies" section.

Regional Economic Impacts Common to All Alternatives: There would be many regional economic impacts associated with the implementation of any of these alternatives. The local tourist industry is dependent on public access to the beaches and communities. Jobs, income, taxes, infrastructure and community services are all dependent on tourism. These regional benefits are not included in the basic test of economic feasibility for each alternative when federal participation is planned, but they are very important to the local sponsor. In recent studies of beach nourishment alternatives, the Corps has contracted with a regional university to analyze the direct, indirect, and induced effects of the beach nourishment project on the local economy. Using an input-output model, regional multipliers are calculated to suggest how many times the investment in the beach nourishment project can be expected to turn over in the local economy. In addition, any loss in tourism dollars can be similarly measured. NCDOT's assistance is needed here to help determine how deeply into regional economic impacts do we want to proceed.

Community Impacts Common to All Alternatives: The NCDOT and their contractors are the experts here. Their assistance is needed on scoping and assessing community impacts.

Report Preparation/Documentation

Reports Common to All Alternatives: Common to all alternatives above is the preparation of the feasibility report and economic appendix. Planning Service Section is responsible for the preparation of the feasibility report main text, economic appendix, and review and coordination of the other technical appendices supplied by the various study team members. This task includes preparation of the required drawings and/or other graphics and reproduction of the report. In addition, a financial capability statement on NCDOT, as the non-Federal sponsor of the project, will be required.

Review Common to All Alternatives: The complete Feasibility Report will undergo an independent technical review, as well as quality assurance and policy reviews at the Division and Headquarters levels and scrutiny from the NEPA process. This item covers responding to comments received on the draft report from the sponsor, higher authority, and the public.

Data Needs Labor Cost For CESAW-TS-PS	\$50,000
Required Analysis Labor Cost For CESAW-TS-PS	\$75,000
Analysis Of Alternatives Labor Cost For CESAW-TS-PS	\$200,000
Alternative Selection Labor Cost For CESAW-TS-PS	\$300,000
 TOTAL HIRED LABOR COST FOR CESAW-TS-PS	 \$625,000

PROJECT MANAGEMENT PLAN
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Appendix L
Detailed Scope of Work
North Carolina
Department of Transportation

Photogrammetry (digital orthophotos)**\$60,000**

This estimate was prepared 13 September 2002, by NCDOT Photogrammetry Unit. This includes color aerial photography and 1-foot resolution digital orthophotos from Oregon Inlet to Ocracoke Inlet. This estimate has been doubled under the assumption this product may be needed twice.

Photogrammetry & location surveys of SAV's**\$75,000**

A 13 September 2003 estimate by NCDOT Photogrammetry and Location & Survey Units of \$98,280 was "ball-parked down" to \$75,000. Their estimate included SAV mapping for Hatteras Village and Ocracoke Hotspots. Also included were location surveys for nearshore bathymetry. It is assumed the current study scope will need somewhat less SAV mapping than calculated in the 13 September 2003 estimate.

Road, bridge, and ferry design**\$500,000**

This estimate includes preliminary design for four potential improvements extending from Frisco to Ocracoke Village. These were identified as possible alternatives by a subcommittee of the Outer Banks Task Force in October 2000.

These alternatives included:

1. Cursory review of a Tunnel from Hatteras to the northern Ocracoke ferry terminal
2. Relocation of the northern Ocracoke ferry terminal further west on Ocracoke Island.
3. Relocation of NC 12 closer to the sound side of Ocracoke Island for about 6 miles.
4. Similar to #3 above, except bridge utilized.
5. Similar to #4 above, except bridge is further out in sound.

Costs for each include roadway design, bridge design, hydraulics design, and geotechnical analysis required to prepare a preliminary design.

Public Involvement**\$175,000**

An October 2000 estimate for public involvement prepared by a subcommittee of the Outer Banks Task Force estimated public involvement at \$590,000. The estimate was reduced to 30 percent of this estimate for the following reasons: Over the past two years, there has already been fairly extensive public involvement covering NCDOT Hot Spot studies and the Bonner Bridge replacement. Secondly, the scope of improvements addressed by the Hatteras & Ocracoke study has been reduced because of the currently proposed length of the Bonner Bridge and the possible construction of a bridge from Avon to Buxton.

Project management**\$250,000**

To arrive at this estimate, the following personnel were assumed: Project Development Assistant Manager at 3.5 days/month for five years and 2 days/month for 5 years for a Project Development Engineer from NCDOT's PDEA Branch.

Coordination and review by NCDOT personnel of study items**\$90,000**

This estimate includes the time for 13 NCDOT staffers from a variety of disciplines. A certain number of days/year over five years were estimated for each of these. This will account for NCDOT staff review of certain items and their attendance at meetings.

Indirect and cumulative impact analysis for NEPA document	\$75,000
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The NCDOT recently increased efforts to document indirect and cumulative impacts of proposed projects. This is a ballpark estimate based on the study scope and comparison to other indirect and cumulative analysis studies performed for other NCDOT projects.

Noise studies required for road, bridge, and ferry alternatives	\$25,000
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Roadway construction alternatives must have a noise analysis performed to conform to FHWA requirements. Based on the scope of likely alternatives, this should not be a major cost item.

Total in-kind estimate	\$1,250,000
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PROJECT MANAGEMENT PLAN
FEASIBILITY PHASE
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SHORE PROTECTION

**ATTACHMENT 1:
PROJECT SCHEDULE**

(RESERVED FOR FUTURE USE)

PROJECT MANAGEMENT PLAN
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ATTACHMENT 2:
PROJECT COST ESTIMATE
(*RESERVED* FOR FUTURE USE)

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ATTACHMENT 3:
PROJECT FUNDING BY FISCAL YEAR

(RESERVED FOR FUTURE USE)

PROJECT MANAGEMENT PLAN
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ATTACHMENT 4:
PROJECT COST AND CHANGE REQUESTS

(RESERVED FOR FUTURE USE)

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**ATTACHMENT 5:
LESSONS LEARNED**

(RESERVED FOR FUTURE USE)

PROJECT MANAGEMENT PLAN
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**ATTACHMENT 6:
QUALITY CONTROL PLAN**

(RESERVED FOR FUTURE USE)